## REMARKS

This paper is responsive to the Office Action mailed from the Patent and Trademark Office on July 1, 2005, which has a shortened statutory period set to expire October 1, 2005.  A one-month extension, extending the period of response until November 1, 2005, is submitted in a petition filed herewith.

## Specification

The specification is rejected for reasons initially set forth in the Office Action dated 11/30/2004.  The Examiner further writes (Office Action, page 2):

With regard to specification rejection, the examiner states one of ordinary skill in the art would not be able to make the instant invention without a complete specification, which means incorporating the critical knowledge from various sources. Accordingly to MPEP 608.01(p), all the essential materials related to the invention should be disclosed in the specification and may not be incorporated by reference. Consequently, the rejection is maintained.

Applicants maintain that the Amendment dated March 28, 2005 was fully responsive to this "rejection" in that the technical details associated with the various cited references are known to those skilled in the art of computer vision.  Appended to this paper is a Declaration under Rule 1.132 signed by David J. Fleet in support of this contention.  Mr. Fleet is both an inventor in the present application and a Professor in the Department of Computer Science at the University of Toronto.  As such, Mr. Fleet is qualified to determine both the level of skill in the computer vision art, and whether the various papers mentioned in the specification represent technical details known to those skilled in the art.

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In light of the appended Declaration, Applicants respectfully request that the rejection directed to the specification be withdrawn.


## Claims

Claims 1-20 pending in the above-identified application. Claims 1-20 are rejected under 35 USC 102 for reasons specified below.

In the current paper, Claims 1, 8, 14, 15 and 19 are amended. Claims 2-7, 9-13, and 16-18 remain as filed, and Claim 20 remains as amended in the Amendment dated March 28, 2005. No new matter is entered. Reconsideration and withdrawal of the pending rejection is respectfully requested.


## Rejections under 35 USC 102

Claim 1-20 rejected under 35 USC 102(b) as being unpatentable over Fleet et al ("A Framework for Modeling Appearance Change in Image Sequences", Computer Vision, 1998, Sixth International Conference on 4-7 Jan. 1998; herein "the Fleet 'framework' paper") for reasons set forth in the first Office Action dated 11/30/2004.

In the present paper, Claims 1, 8, 14, 15 and 19 are amended to further clarify the present invention. In view of these amendments, Claims 1-20 are believed to be clearly distinguished over the Fleet 'framework' paper.

Claim 1 is amended to recite (in pertinent part):

> ...the appearance model defined by a
> stable component including a first mixing
> probability **and a first data parameter**
> **that is calculated using a plurality of**
> **image data values respectively provided in**
> **a relatively large number of said**
> **sequential image frames, the relatively**

> **large number being greater than three,** the
> appearance model also including a
> transient component having a second mixing
> probability and second data parameter that
> is calculated using a plurality of image
> data values respectively provided in a
> relatively small number of said sequential
> image frames...

Support for the amendment to Claim 1 is provided, for
example, in paragraph 0050 of Applicants' specification
(emphasis added):

> **[0050]**  In accordance with yet another
> aspect of the present invention, stable
> component 130 includes one or more stable
> data parameters 134 that are utilized to
> determine how well a new datum compares
> with previously received image data.  As
> mentioned above, stable component 130
> stores a digital representation of a
> target image based on a relatively large
> number of image frames.  **Accordingly, in
> the embodiments described below, stable
> data parameter 134 is represented using
> statistical methods as mean $\mu_S$ and
> standard deviation $\sigma_S$ parameters that are
> calculated using data values received over
> a predetermined number (e.g., fifteen) of
> image frames preceding the currently
> received image frame,** provided the data
> values used in the calculation fall within
> a predefined range of the mean (i.e.,
> outliers are excluded).  Alternatively,
> stable data parameter 134 may be
> calculated using any alternative method,
> such as an average of selected (e.g.,
> every third) data value...

As amended, Claim 1 is distinguished over the Fleet
'framework' paper in that the 'framework' paper describes a
method that is applied independently to every pair of
consecutive image frames (i.e., a first frame taken at time
"t" and a second frame taken at time "t+1"; for example,

see the paragraph bridging the two columns on page 660,

copied below for reference):

> We propose four generative models to "explain" the classes of appearance change illustrated in Figure 1. A change in "form" is modeled as the motion of pixels in one image to those in the next image. An image at time $t + 1$ can be explained by warping the image at time $t$ using this image motion.

According to the teachings disclosed in the

'framework' paper, no information is propagated forward in

time (i.e., each calculation involves data from only two

image frames). In practice, because data from only two

frames is utilized, the affine motions generated by the

'framework' paper method can vary wildly from one time (or

pair of frames) to the next. In contrast, by utilizing a

"stable component" that is calculated from image data

provided in a relatively large number of frames", the

present invention is able to provide a temporal

"smoothness" that cannot be avoided utilizing only the

method of the Fleet 'framework' paper. As such, Claim 1 is

distinguished over the Fleet 'framework' paper at least

because the Fleet 'framework' fails to teach or suggest "a

first data parameter that is calculated using a plurality

of image data values respectively provided in a relatively

large number of said sequential image frames, the

relatively large number being greater than three", as

recited in Claim 1.

Claims 2-7 are dependent from Claim 1, and are

distinguished over the Fleet 'framework' paper for at least

the reasons provided above with reference to Claim 1.

Similar to Claim 1, Claim 8 is amended to recite (in

pertinent part):

> ...estimating a motion of the
> target object **using an adaptive
> appearance model including a first
> image component having parameters that
> are calculated using a plurality of
> image data values respectively received
> over a relatively large number of image
> frames temporally preceding the current
> image frame, the relatively large
> number being greater than three**, and a
> second image component having
> parameters that are calculated using a
> plurality of image data values
> respectively over the relatively small
> number of said sequential image frames
> temporally preceding the current image
> frame...

Support for and the benefit of amended Claim 8 is similar to that provided above with reference to Claim 1. As such, amended Claim 8 is believed to be distinguished over the Fleet 'framework' paper for reasons similar to those provided above with reference to Claim 1.

Claims 9-13 are dependent from Claim 8, and are distinguished over the Fleet 'framework' paper for at least the reasons provided above with reference to Claim 8.

Similar to Claims 1 and 8, Claim 14 is amended to recite (in pertinent part):

> ...a first image component having
> parameters defined by  image data that
> remains stable over a relatively large
> number of said sequential image frames,
> the relatively large number being
> greater than three, **wherein the
> parameters of the first image component
> include a first parameter that is
> calculated using a plurality of image
> data values respectively provided in
> said relatively large number of
> sequential frames**...

Support for and the benefit of amended Claim 14 is similar to that provided above with reference to Claim 1. As such, amended Claim 14 is believed to be distinguished over the Fleet 'framework' paper for reasons similar to those provided above with reference to Claim 1.

Claims 15-18 are dependent from Claim 14, and are distinguished over the Fleet 'framework' paper for at least the reasons provided above with reference to Claim 14. Claim 15 is amended to conform with amended Claim 14.

Similar to Claims 1, 8 and 14, Claim 19 is amended to recite (in pertinent part):

> ...a first image component
> including a first mixing probability
> having a value that is determined by a
> first parameter that is calculated
> using a plurality of image data values
> respectively provided in a relatively
> large number of said sequential image
> frames, the relatively large number
> being greater than three...

Support for and the benefit of amended Claim 19 is similar to that provided above with reference to Claim 1. As such, amended Claim 19 is believed to be distinguished over the Fleet 'framework' paper for reasons similar to those provided above with reference to Claim 1.

Claim 20 is dependent from Claim 19, and are distinguished over the Fleet 'framework' paper for at least the reasons provided above with reference to Claim 19.

Other Issues Raised in the Second Office Action

In the second Office Action, the Examiner further writes (Office Action, page 2):

Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.

Applicants respectfully traverse the above-quoted objection. In the Amendment dated March 28, 2005, Applicants very clearly stated that Claim 1 is distinguished over Fleet in that the framework for modeling appearance changes taught by Fleet fails to teach or suggest certain features recited in Claim 1. The same approach is used above. Should the Examiner maintain this objection in response to this paper, the Examiner is respectfully requested to explain how the Applicants may phrase their arguments in order to meet the Examiner's expectations, or to direct Applicants' attorney to the MPEP section upon which the Examiner relies in maintaining this objection.

The Examiner further writes (Office Action, page 2):

Additionally, the examiner recognizes the newly added limitation of "the relatively large number being greater than three" is nowhere to be found in the specification.

In furtherance to Applicants' response directing the Examiner to paragraph 0012 of Applicants' specification, the Examiner is further directed to paragraph 0048 of Applicants' specification, which teaches "The terms "stability" and "stable" are used herein to describe image

data values that remain relatively unchanged over a
relatively long time scale (e.g., over five or more
sequential image frames)." Applicants contend that "the
relatively large number being greater than three", as
recited in Claim 1, is fully supported by this sentence.
Further support that "relatively large number" is fairly
defined as "greater than three" is provided in the
following sentences of paragraph 0048 in the discussion of
"wandering" component W:

> In alternative embodiments, W component
> 140A may be modified to compare data
> from a small number (e.g., two or
> three) of frames preceding the current
> frame.

That is, by providing an example of a "small number" of
"two or three", it stands to reason that "relatively large
number" is fairly defined from the specification as
"greater than three". Accordingly, Applicants respectfully
request reconsideration and withdrawal of this point of
rejection.

The remaining issues raised by the Examiner in
paragraph 4 of the Office Action are believed to be moot in
view of the amendments and arguments set forth above.

For at least the above reasons, Applicants
respectfully request reconsideration and withdrawal of the
rejections under 35 USC 102.

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## CONCLUSION

Claims 1-20 are pending in the present Application. Reconsideration and allowance of these claims is respectfully requested. If there are any questions, please telephone the undersigned at (408) 451-5902 to expedite prosecution of this case.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as FIRST CLASS MAIL in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on October 28, 2005.

10/28/2005                         Rebecca A. Baumann
Date          Signature: Rebecca A. Baumann

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